WHAT IS CLAIMED IS:

1. An automatic focusing method comprising:

scanning light from a light source which passes a confocal pattern on a sample through an objective lens while relatively moving one of the sample and the objective lens along a direction of an optical axis;

acquiring two or more sectioning images by converting the light from the sample which penetrates the confocal pattern through the objective lens by photoelectric conversion means; and

changing an opening diameter of the variable diaphragm arranged at the pupil position of the objective lens or a conjugated position to the pupil position thereof to reduce a NA of the objective lens when focusing is not obtained and repeating an operation of taking two or more sectioning images by the photoelectric conversion means and obtaining the focusing position.

2. An automatic focusing method comprising:

scanning the sample with light from a light source which passed a confocal pattern while moving one of a sample and an objective lens along the direction of an optical axis at a predetermined sampling interval;

acquiring two or more sectioning images by converting light from the sample which penetrates the confocal pattern through the objective lens by the photoelectric conversion means;

obtaining a focusing position according to a predetermined function based on the plurality of sectioning images taken by the photoelectric conversion means; and

changing an opening diameter of the variable diaphragm arranged at the pupil position of the objective lens or a conjugated position to the pupil position thereof to reduce a NA of the objective lens when focusing is not obtained and repeating an operation of taking two or more sectioning images by the photoelectric conversion means and obtaining the focusing position.

3. The automatic focusing method according to claim 2, wherein an objective lens with low magnification and high NA is used for the objective lens.

4. The automatic focusing method according to claim 2, wherein two or more sectioning images are taken without changing the predetermined sampling interval when the NA of the objective lens is changed.

5. The automatic focusing method according to claim 2, wherein an operation to which the focusing position is obtained is repeated until three or more sectioning images are acquired.

6. The automatic focusing method according to claim 2, wherein whether the sectioning image uses data of a part where disorder is caused by an aberration of

the objective lens is judged and the sectioning image is acquired by reducing the NA of the objective lens when the disordered data is used.